



## L'influenza della struttura forestale sul rinforzo radicale: un'esperienza di studio alpina

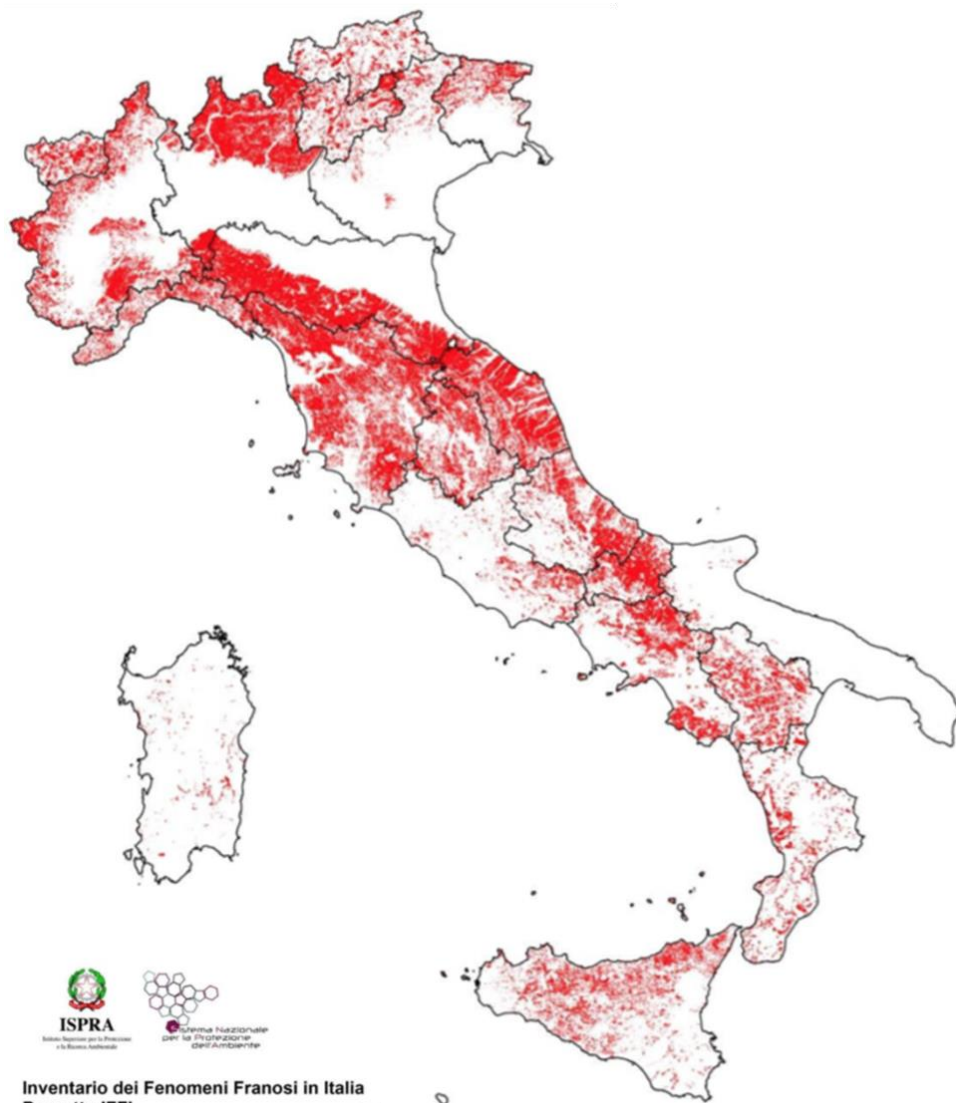
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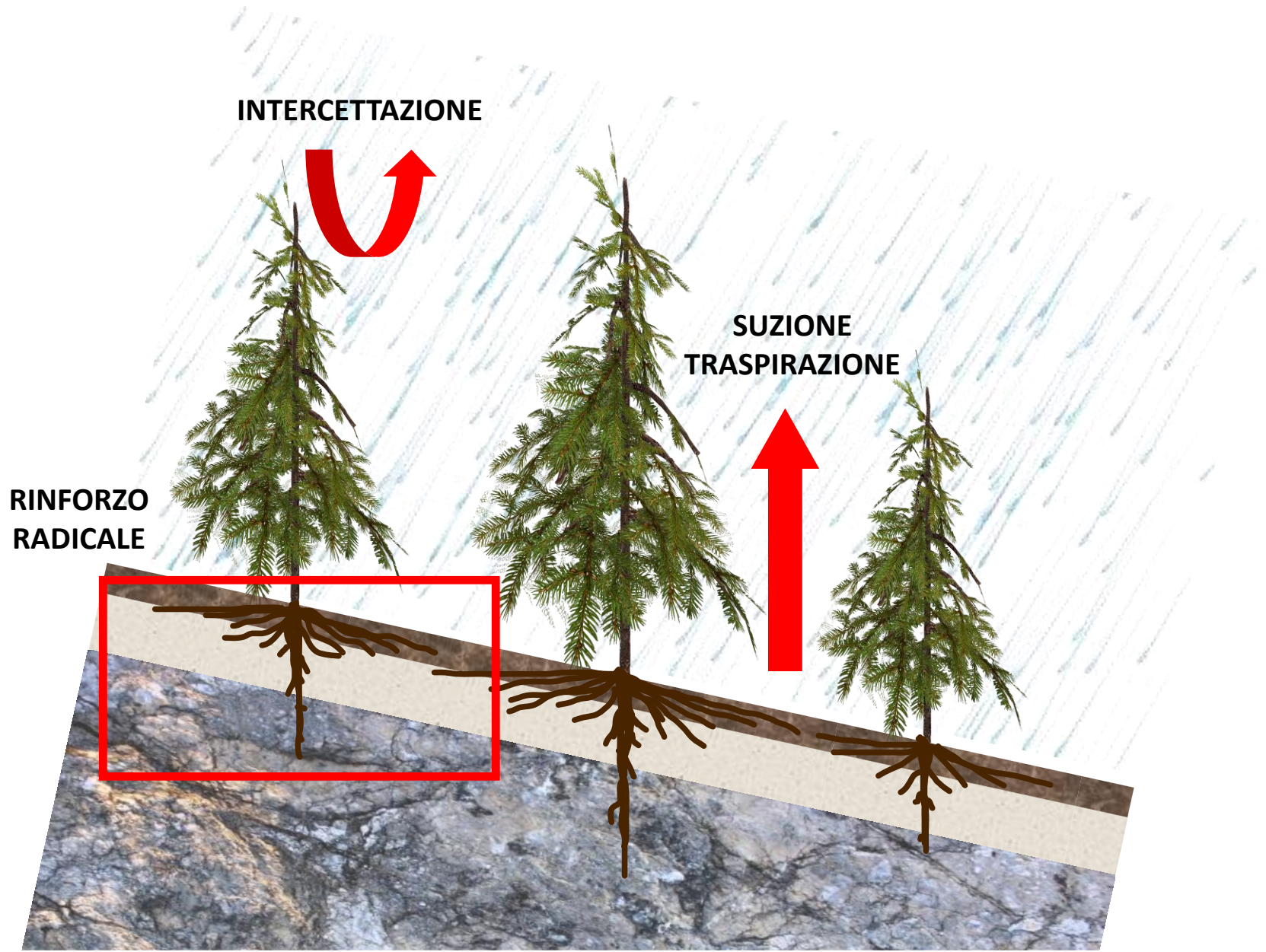


### ISPRA, IFFI 2007

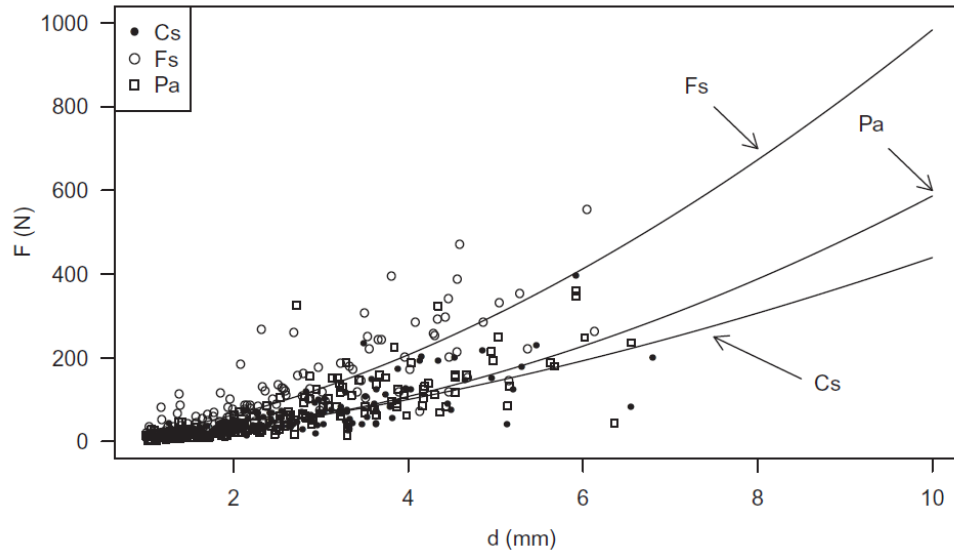
- In Italia ci sono circa 470.000 frane
- Circa 7 % della superficie nazionale
- Circa lo 0,6 % della superficie in zone collinari e montane

*“Le Regioni che presentano l’indice di franosità su territorio montano-collinare più elevato sono Lombardia, Emilia Romagna, Marche, Valle d’Aosta e Piemonte”*



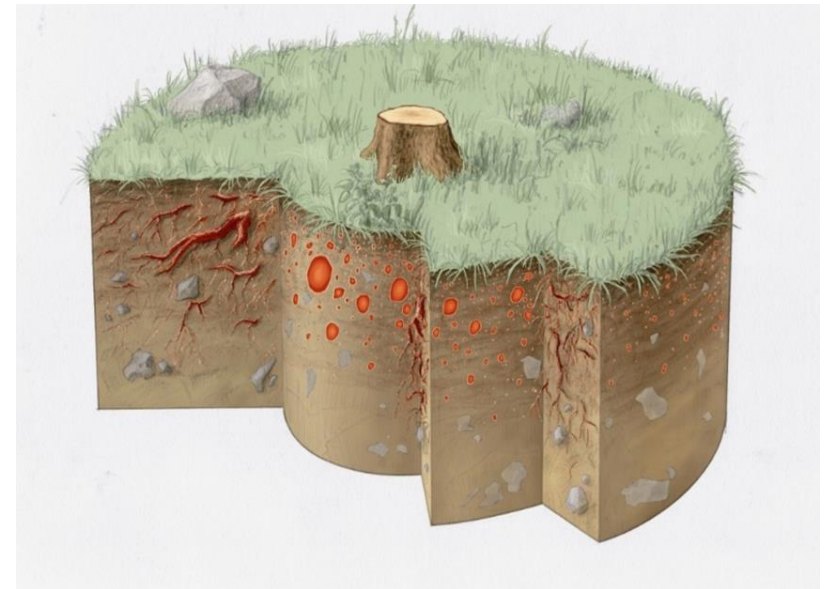


Stato attuale delle conoscenze e modellistica

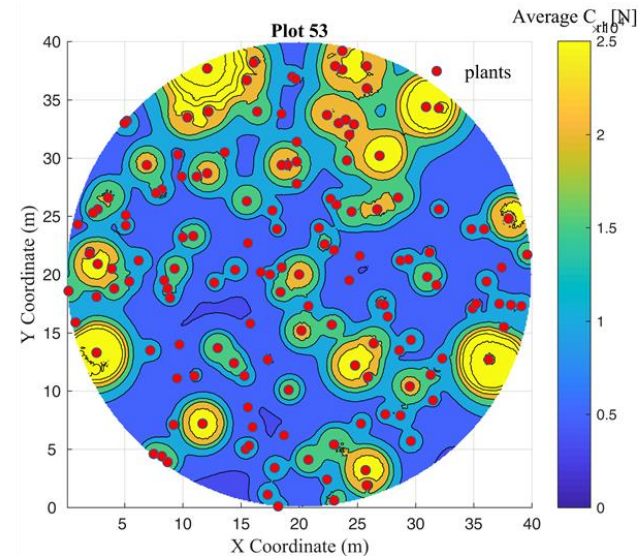
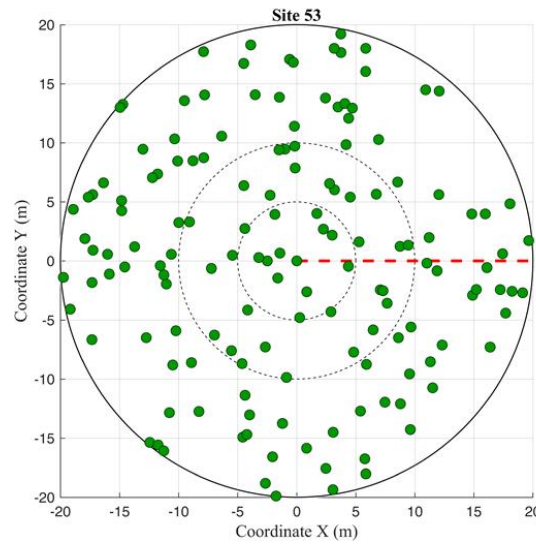


**Bischetti et al. 2009**  
**Chiaradia et al. 2016**

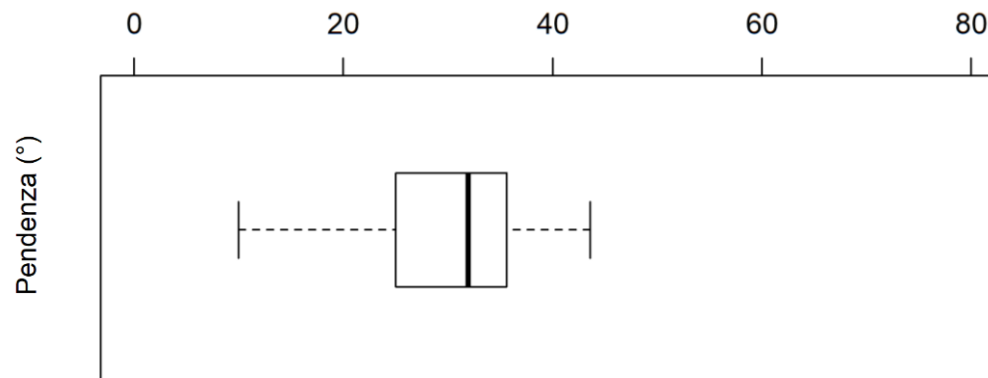
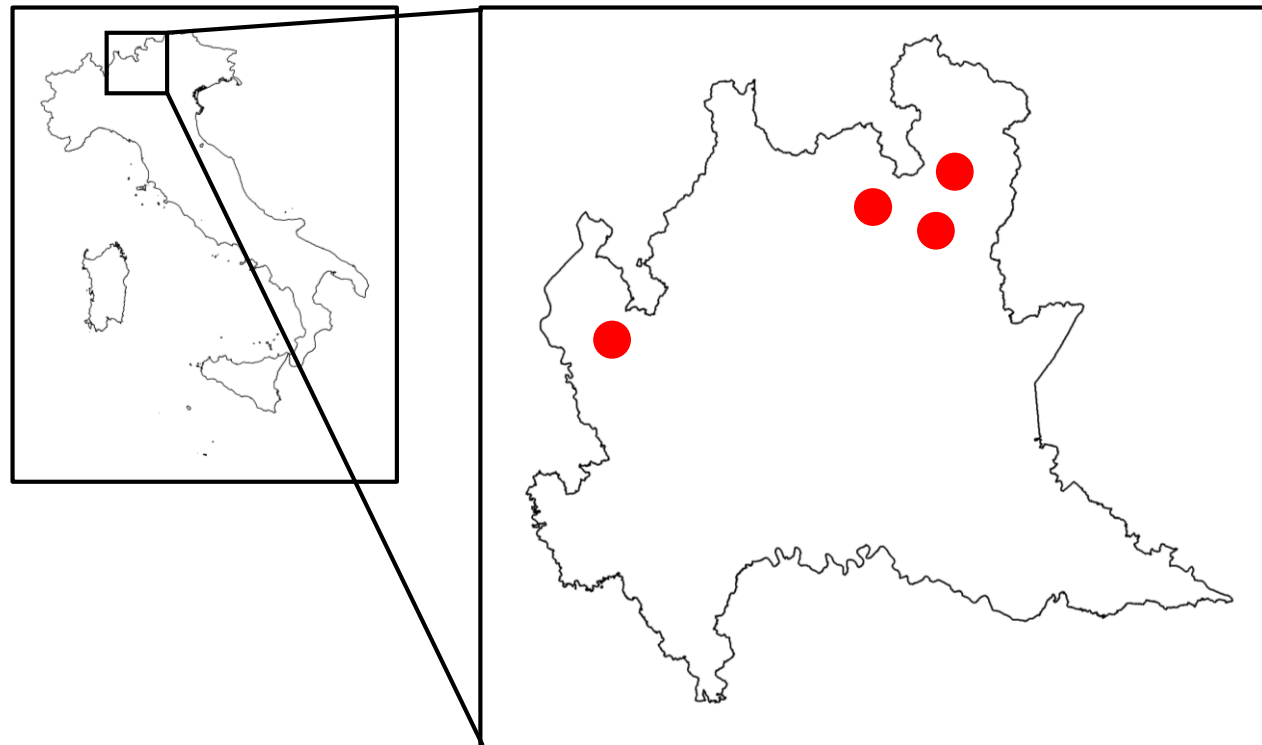
**Schwarz et al. 2010**  
**Schwarz et al. 2012**  
**Schwarz et al. 2013**



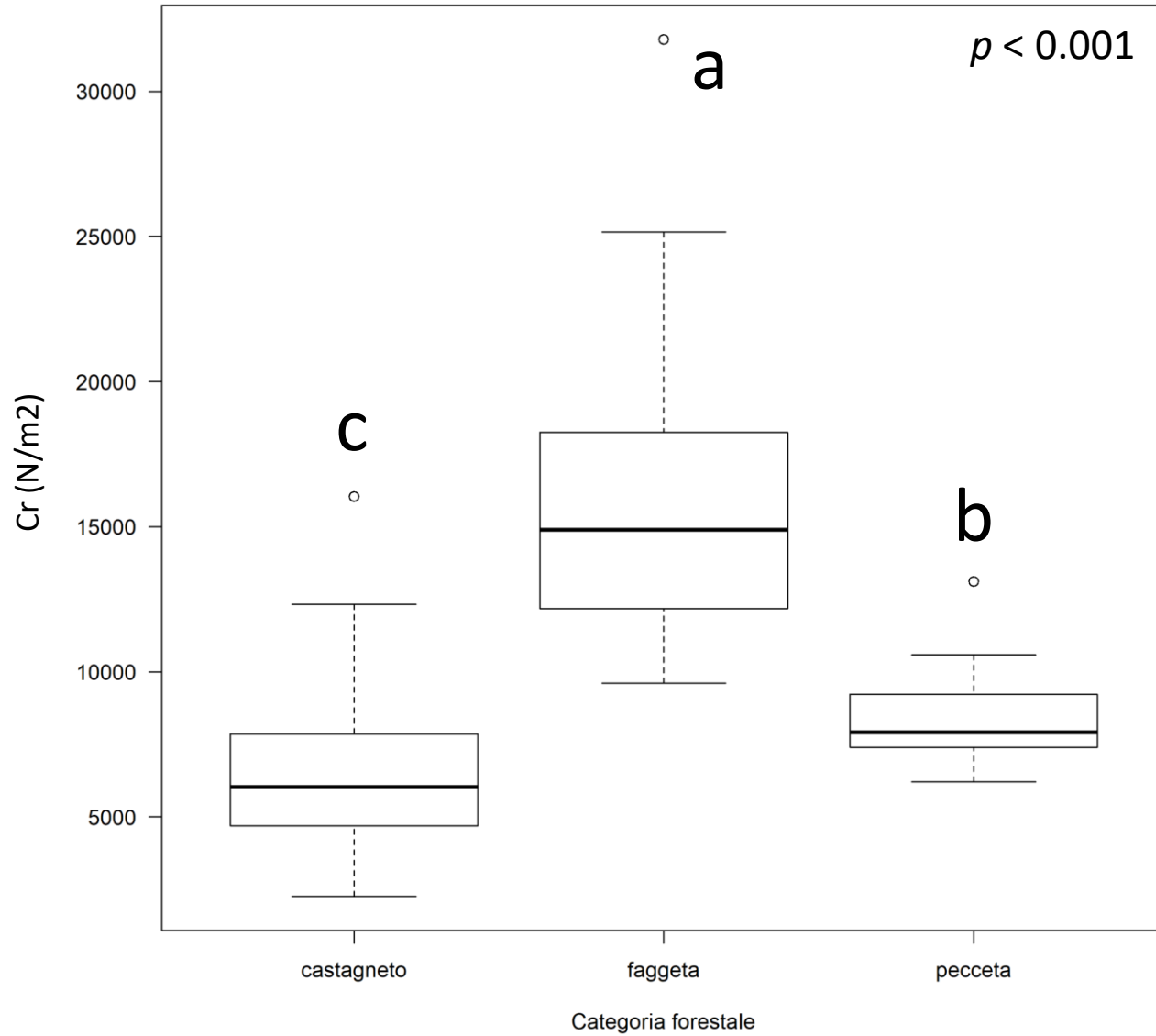
## Un modello per la stima del rinforzo a scala di popolamento forestale



## Aree di studio e campionamenti

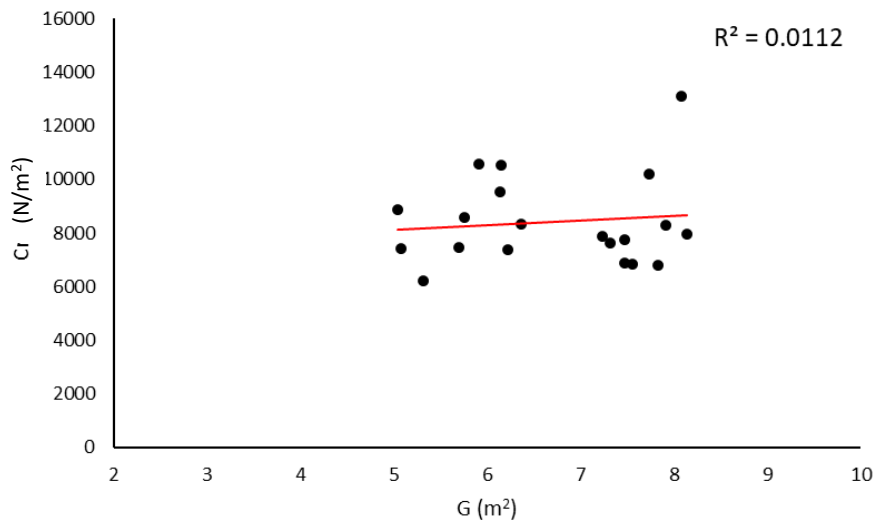


## Rinforzo radicale e categorie forestali

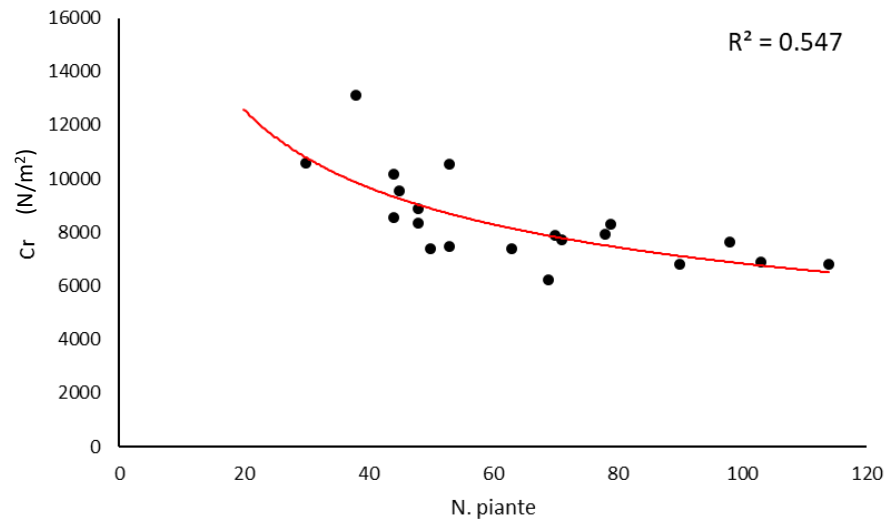


**Peccete: struttura e rinforzo a confronto**

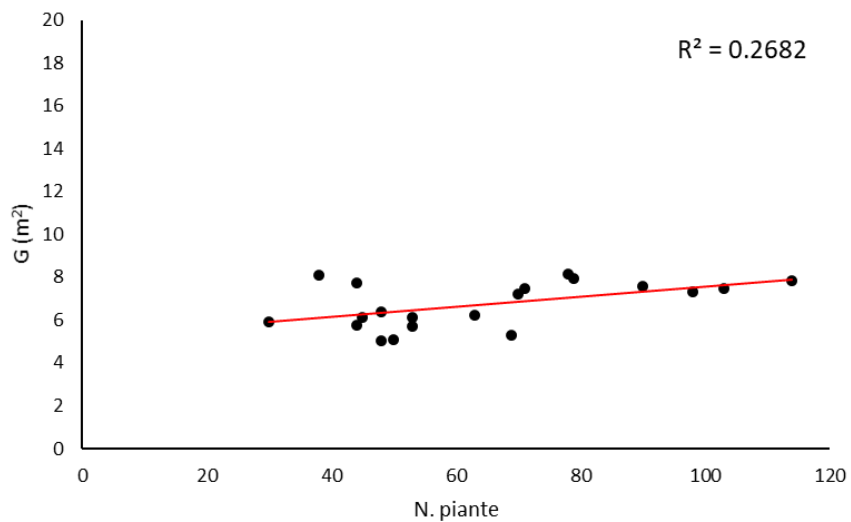
**a**



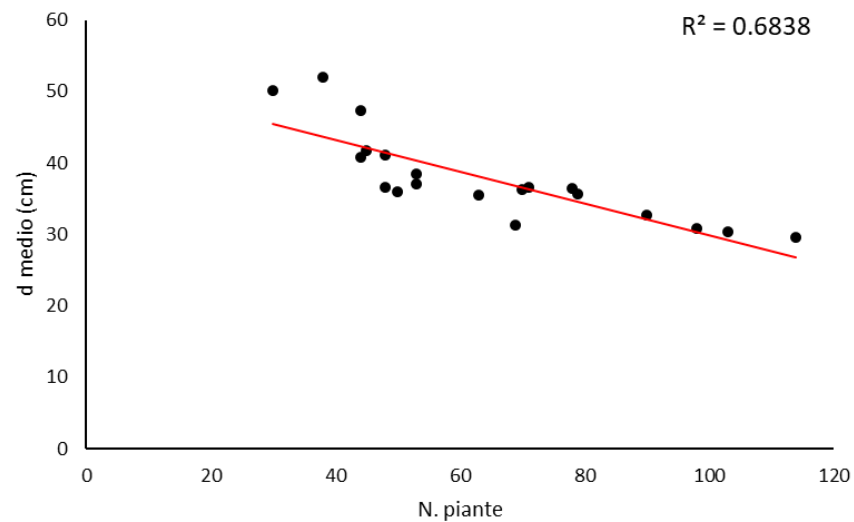
**b**



**c**

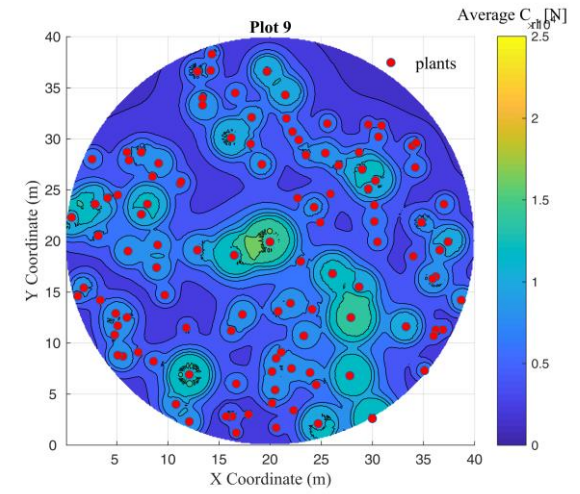
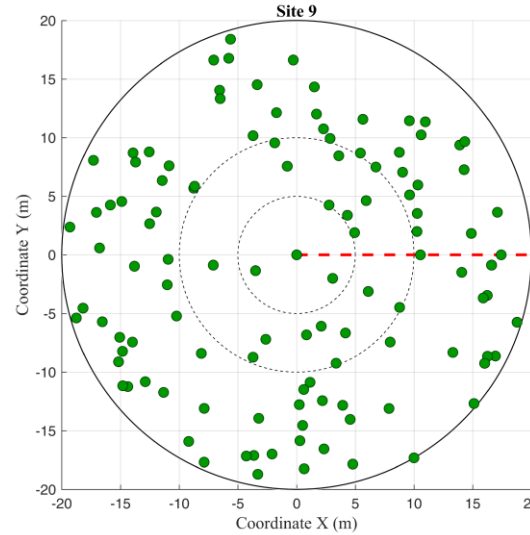


**d**

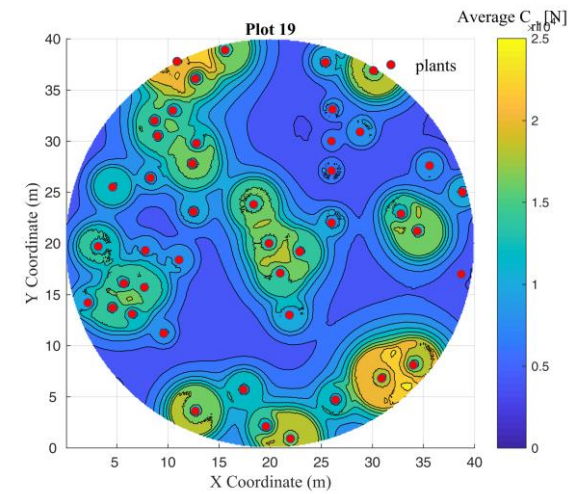
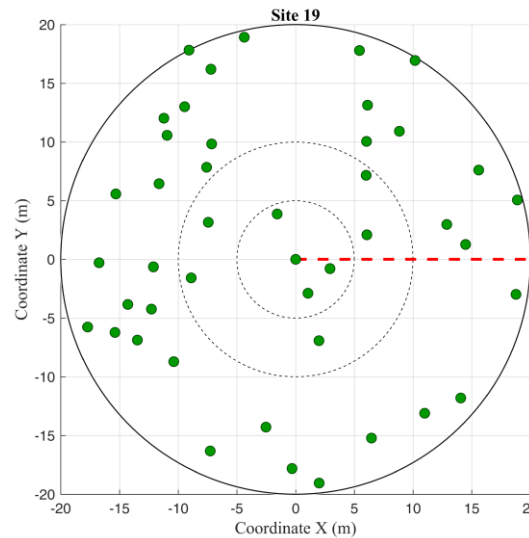


**Peccete: struttura e rinforzo a confronto**

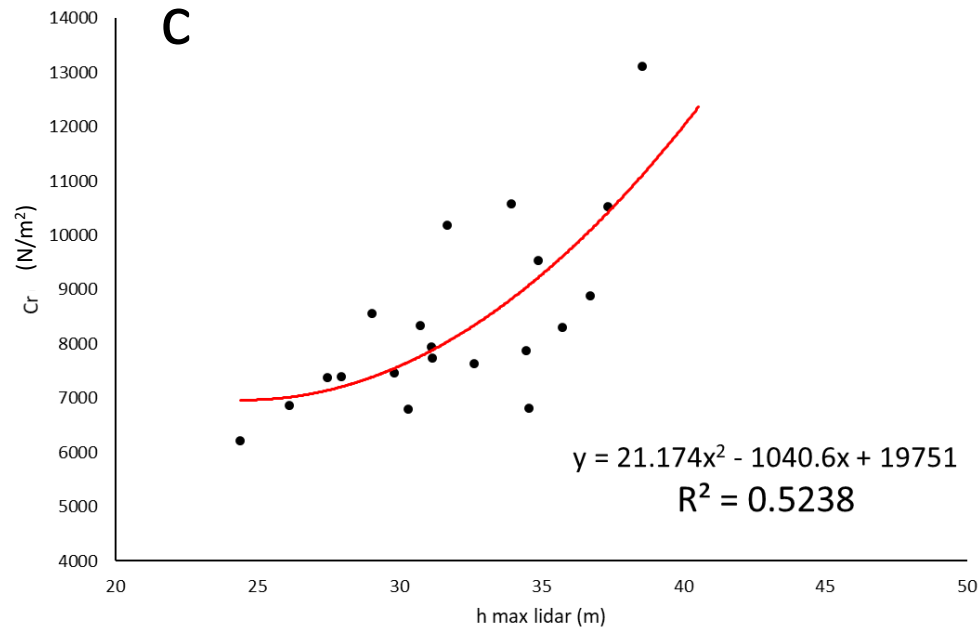
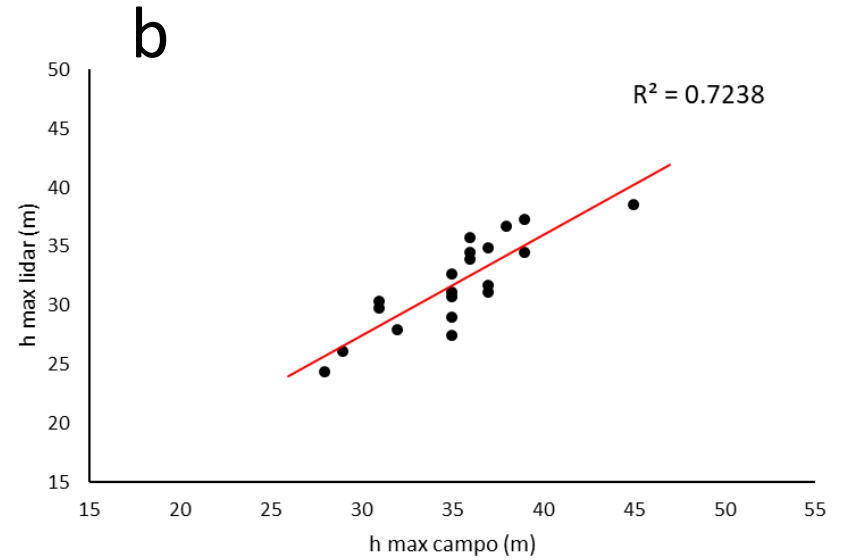
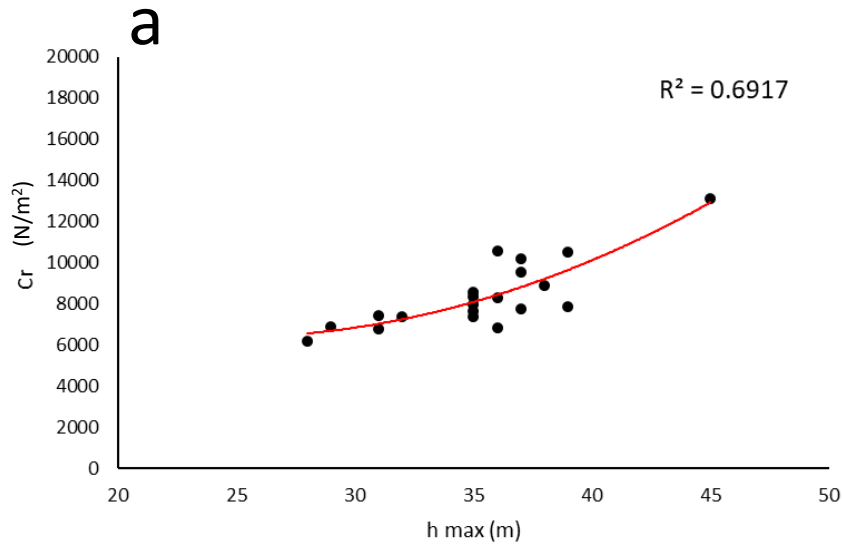
Plot 9  $G = 7.8 \text{ m}^2$

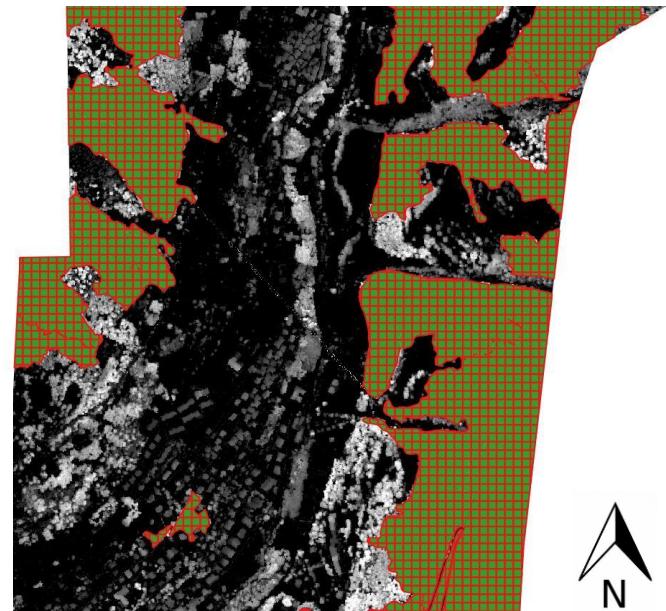
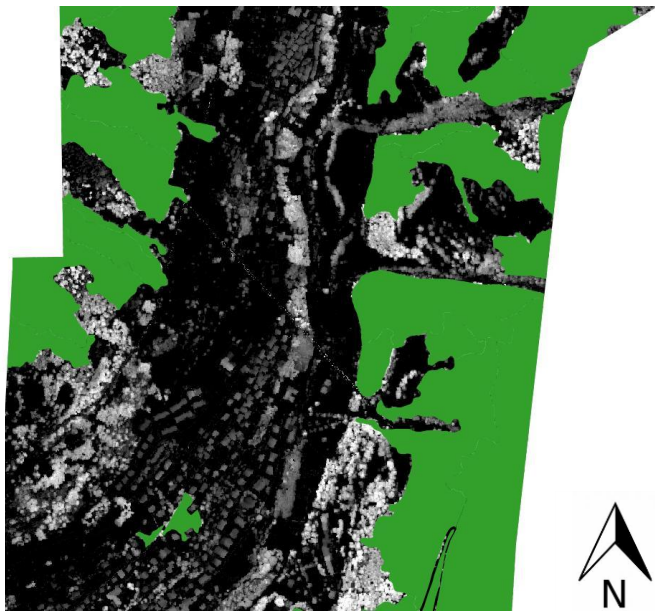
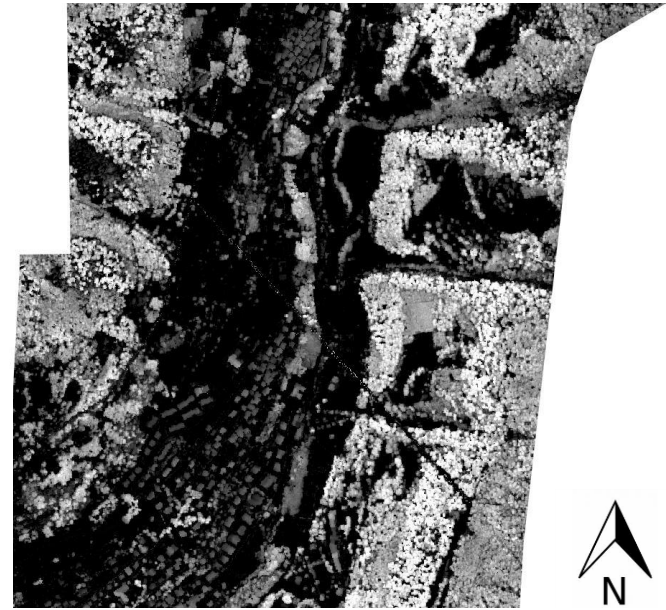
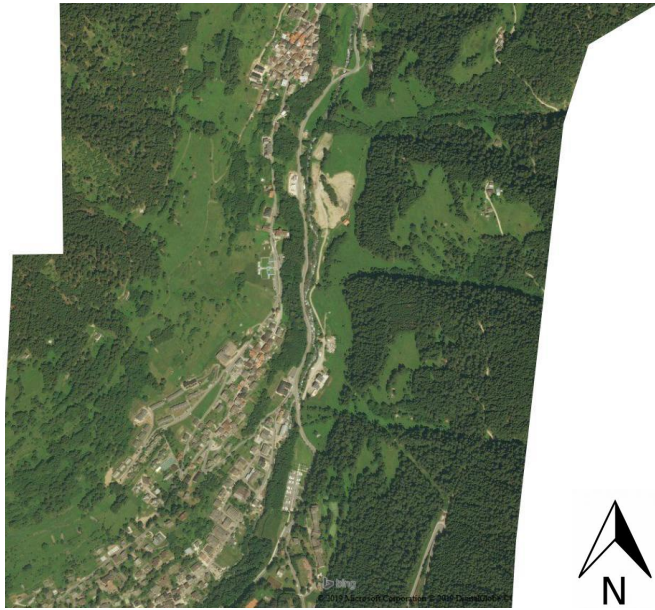


Plot 19  $G = 7.7 \text{ m}^2$

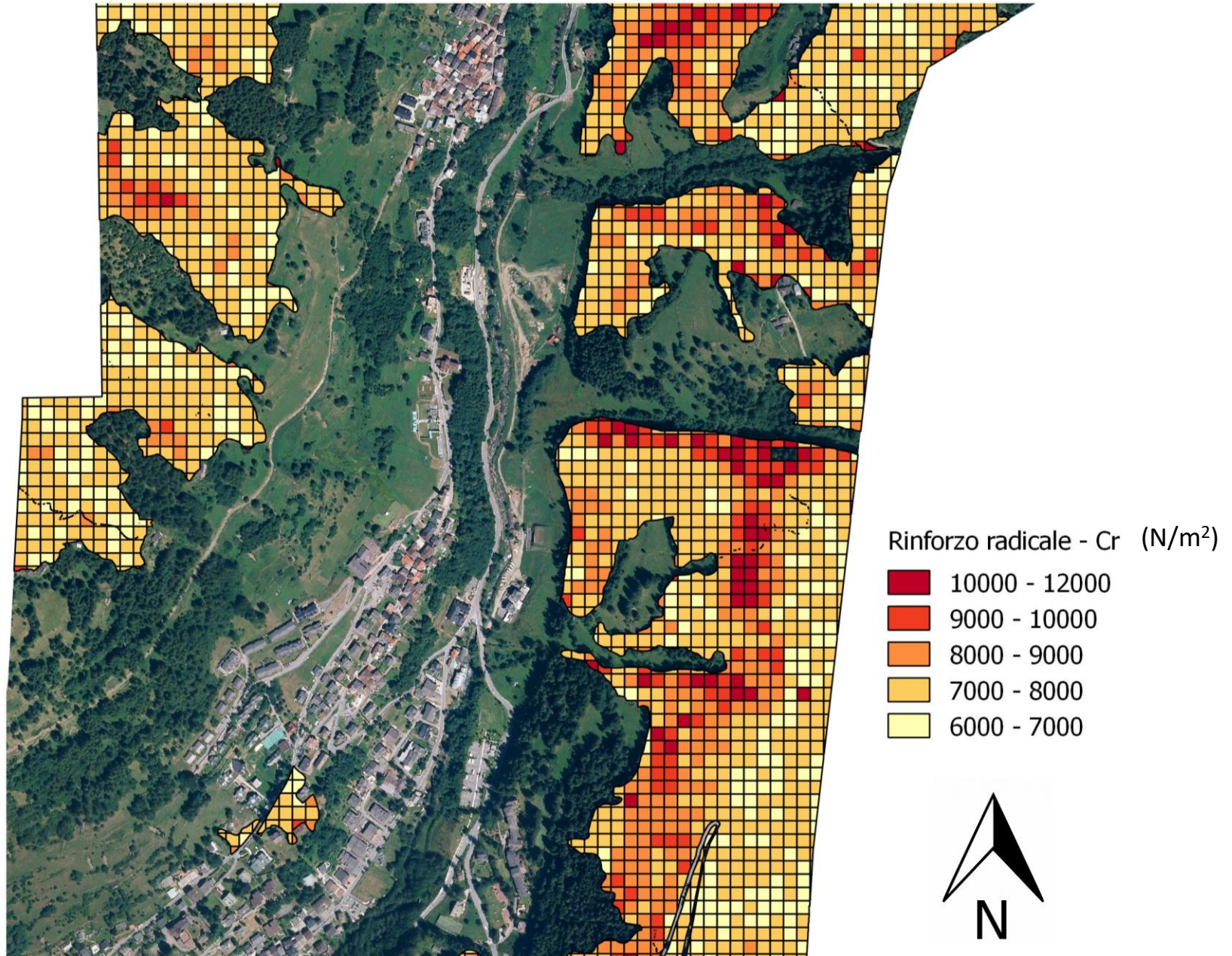


**Peccete: rinforzo radicale e relazioni con metriche Lidar**





**Peccete: modelli empirici per mappare il rinforzo radicale**



## Conclusioni e prospettive future

- Lo studio evidenzia **differenze di rinforzo radicale** in ragione della diversa **categoria forestale**;
- Le **prospettive future** si concentreranno nell'**incrementare il numero di aree di saggio** e in trovare **relazioni con altre variabili strutturali**;
- L'elaborazione di mappe di rinforzo radicale potrà rendersi utile nell'applicazione di **modelli fisicamente-basati e spazialmente-distribuiti** per determinare carte di **suscettibilità al rischio franamento**.

## Il Progetto TREE:HERO

- TREE distribution patterns: Hillslope failure prevention through forest management (TREE:HERO)
- Parte del programma di **finanziamenti 2017** di **Fondazione Cariplo** intitolato «**Ricerca dedicata al dissesto idrogeologico: un contributo per la previsione, la prevenzione e la mitigazione del rischio**».



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